A REVISION OF THE KINGFISHER GENUS RAMPHALCYON (PELARGOPSIS).

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The many specimens of *Ramphalcyon* (=*Pelargopsis*) collected by Dr. W. L. Abbott during his various explorations in the East Indies include nearly all of these birds now in the United States National Museum. Mr. Robert Ridgway, the curator of birds, some time ago referred them to the writer for identification, which has led, almost unconsciously, into an investigation of all the forms of the genus. As the results may not be without interest for other workers in the same field, it seems well to publish them at the present time.

The genus *Ramphalcyon* is a well-defined group in the subfamily Alcedininæ, and is naturally divisible, according to coloration, into three sections, which appear to represent three species, two of them separable into geographical races.

One of these sections comprises the brown-backed, brown-winged, red-billed *Ramphalcyon amauroptera*, which ranges from eastern India to the Malay Peninsula, without, however, any apparent modification into subspecies.

The second section is composed of *Ramphalcyon melanorhynchus* and its two conspecific forms, and is confined to Celebes and a few adjacent islands. This species has the bill partly or wholly black, and the back and wings brownish or dusky, with a greenish or bluish sheen.

The third section contains the remaining forms, all characterized by a red bill, and more or less greenish back and wings. This is a difficult group, particularly when studied with insufficient material, and is not at present in a satisfactory condition. The examination of altogether some 80 examples, mostly of recent collection, largely from new localities, and representing all but one of the forms,[a] indicates

[a] *Ramphalcyon capensis floresiana.*

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almost conclusively that all, with the possible exception of *Ramphalcyon gigantea*, are best treated as subspecies of *Ramphalcyon capensis* (=*fraseri*).[a] It is true, of course, that birds like *Ramphalcyon javana* (=*leucocephala*) and *R. gouldi* are very different from *R. gurial* and *R. malaccensis*, but *R. intermedia* and *R. capensis* so completely bridge this gap that there is nothing to do but to call them all subspecies. As with some other kingfishers, altogether too little account has been taken of individual, of seasonal, age, and sexual variation, for some of the supposedly distinct species, even though separated by water, will be found on comparison of a sufficient series to differ by only average characters.

Individual variation, however, is not unusually great, except in a few of the races, such as *Ramphalcyon capensis capensis*, in which it produces birds both with or without a brown cap. The individual color variation affects principally the depth of shade on the pileum and lower surface, and the tint of back, scapulars, and wings. The effect of wear is most seen on the pileum, which often is thus made much paler; other parts are sometimes appreciably, but rarely much, altered by the same influence, the lower surface paling, the back and wings becoming more bluish.

The notable difference that exists between the sexes is one of the most interesting points brought out by the present investigation, for almost all writers unite in considering the male and female practically alike. As a matter of fact, however, the female is nearly always decidedly larger, and has back and wings, sometimes tail as well, duller and more brownish or greenish. These differences are very great and constant in some subspecies, much less and not trenchant in others, but the females are nearly always distinguishable by color, or at least by size.

Immature birds are duller, more brownish or greenish on the back and wings than adults, the males in this condition resembling adult females. Other indications of immaturity are broad buff or ochraceous edgings on the wing-coverts, and numerous conspicuous blackish margins on the feathers of the breast and jugulum. Neither of these, however, is an infallible criterion—although the latter commonly passes as such—for both appear sometimes on freshly molted birds that bear every other indication of maturity. It seems, however, that these edgings on both breast and wing-coverts are much less numerous and conspicuous on mature individuals, possibly are altogether absent on very old birds, and at any rate probably soon disappear under abrasion.

This species, *Ramphalcyon capensis*, has a wide range, for it extends from Ceylon, India, and Burma to Cochin China, the Philippine

[a] *Cf.* Hartert, Nov. Zool., IX, 1902, pp. 202–203.

Islands, Borneo, Flores, Java, and Sumatra with its western outlying islands. It is common and well distributed over this area, but separates into many local forms, of which at present fifteen seem to be recognizable. As is the case with many oriental and East Indian birds, the geographical distribution of these races presents several interesting anomolies. For instance, *Ramphalcyon c. intermedia*, of the Nicobar Islands, is most closely allied to the Bornean form, and separated from it by the totally dissimilar Malayan *Ramphalcyon c. malaccensis*. Again, *Ramphalcyon c. floresiana*, from Flores, is very much like *Ramphalcyon c. malaccensis*, and very different from the intervening Javan *Ramphalcyon c. capensis* and Bornean *R. c. javana*. Furthermore, both *Ramphalcyon c. gurial* and *R. c. burmanica* much more nearly resemble *Ramphalcyon c. simalurensis*, from Simalur Island, and *Ramphalcyon c. isoptera*,[a] from the Pagi Islands, than they do either the Malayan *R. c. malaccensis* or *Ramphalcyon c. cyanopteryx*,[b] from northwestern Sumatra. Also the hereinafter described *Ramphalcyon c. hydrophila*,[c] from Singapore and Lingga Islands, is more like *Ramphalcyon c. sodalis*, from the Banjak Islands, off the northwestern coast of Sumatra, than like the mainland Sumatran *Ramphalcyon c. cyanopteryx*.[b] Other more local instances are given below under *Ramphalcyon c. nesoeca*.[d]

The kingfishers of this group have for long passed under the generic name *Pelargopsis* Gloger;[e] but an examination of the original diagnosis shows this name to be clearly a *nomen nudum* there. It is proposed in the following fashion:

Mehrere andere würde man allenfalls Storchschnäbler (*Pelargopsis*) nennen können. Denn sowohl ihre, noch grösseren und bedeutend stärkeren Schnäbel, die übrigens noch nirgends aufgetrieben erscheinen, wie ihre dickeren Köpfe, gleichen mehr jenen der Störche.

No species is mentioned, and even the common name "Storchschnäbler" is here used apparently for the first time, as by careful search in the literature no previous mention of these birds as "stork-bills," or "stork-billed kingfishers," has been brought to light. Furthermore, the diagnosis given by Gloger[e] is not certainly identifiable, for it is so brief and indefinite that it would just as well apply to *Ceryle*, or even *Dacelo*, as to the birds here under discussion; and we must therefore abandon *Pelargopsis* Gloger. The next available generic name for the stork-billed kingfishers is *Ramphalcyon* Reichenbach.[f]

The literature of this genus is not extensive, and consists chiefly of scattered references in faunal and systematic books and papers.

[a] See page 671. [b] See page 676. [c] See page 677. [d] See page 674.
[e] Gem. Hand- und Hilfsb. Nat., I, 1842, p. 338.
[f] Handb. Spec. Orn., 1851, p. 16.

The most important reviews of the group, three in number, are by Dr. R. B. Sharpe.[a]

The material on which the present investigations rest consists of the collection of the United States National Museum, with the addition of a small number of specimens from the Academy of Natural Sciences of Philadelphia. For the privilege of making use of the latter the writer is indebted to the courtesy of Mr. Witmer Stone.

Genus RAMPHALCYON Reichenbach.

Pelargopsis Gloger, Gem. Hand -und Hilfsb. Nat., I, 1842, p. 338 (*nomen nudum*).

Ramphalcyon Reichenbach, Handb. Spec. Orn., 1851, p. 16 (type,[b] *Alcedo capensis* Linnæus).

Hylcaon Reichenbach, Handb. Spec. Orn., 1851, p. 18 (type, *Alcedo melanorhyncha* Temminck).

Pelargopsis Cabanis and Heine, Mus. Hein., II, 1860, p. 156 (type, *Alcedo javana* Boddaert).

Generic characters.—Similar to *Ceryle*, but bill relatively larger and heavier, especially broader; culmen decidedly flattened at base, instead of rounded; wing more rounded, the third and fourth[c] primaries, in place of the second and third,[c] longest, the outermost (first) at least 25 mm., instead of not over 17 mm., shorter than the longest; tail relatively longer; inner toe and claw falling far short of base of middle claw, instead of about reaching it, as in *Ceryle*.

Type.—*Alcedo capensis* Linnæus.

Geographical distribution.—Ceylon, India, and Burma, east to Siam, Cambodia, and the Philippine Islands; south to Celebes, Borneo, Flores, Java, and Sumatra with its outlying islands.

KEY TO THE SPECIES AND SUBSPECIES OF RAMPHALCYON.

a. Back, wings, scapulars, and tail brown, without greenish or bluish tinge.
Ramphalcyon amauroptera.

a'. Back, wings, scapulars, and tail with more or less greenish or bluish tinge.

b. Bill wholly or largely black.

c. Bill entirely black.....*Ramphalcyon melanorhyncha melanorhyncha.*

c'. Bill with red spots at base.

d. Red spots at base of bill small.
Ramphalcyon melanorhyncha cultreptorhyncha.

d'. Red spots at base of bill large.
Ramphalcyon melanorhyncha dichrorhyncha.

b'. Bill red, except the dusky tip.

c. Pileum not distinctly capped with brown.

d. Head and under parts very pale buff or cream color.
Ramphalcyon capensis gigantea.

[a] Proc. Zool. Soc. Lond., 1870, pp. 61–69; Monograph Alcedinidæ, 1870, pp. 95–111, pls. XXIX–XXXVI; Cat. Birds Brit. Mus., XVII, 1892, pp. 96–107.

[b] Fixed by Gray, in List Genera and Subgenera Birds, 1855, p. 16.

[c] Counting from the outermost.

d'. Head and under parts deep ochraceous or tawny.
e. Mantle much more greenish ..... *Ramphalcyon capensis gouldi*
e'. Mantle much more bluish.
f. Pileum more mixed with brownish; mantle somewhat more greenish ..... *Ramphalcyon capensis capensis.*
f'. Pileum less mixed with brownish, often not at all; mantle somewhat more bluish.
g. Larger; darker below, throat not whitish.
Ramphalcyon capensis intermedia.
g'. Smaller; lighter below, throat usually whitish.
Ramphalcyon capensis javana.
c'. Pileum distinctly capped with brown.
d. Wing of female usually not less than 157 mm.
e. Back, wings, and tail paler, duller, and more greenish.
f. Pileum darker; lower parts much paler, the throat whitish.
Ramphalcyon capensis gurial.
f'. Pileum lighter; lower parts much darker, the throat usually not whitish ..... *Ramphalcyon capensis burmanica.*
e'. Back, wings, and tail darker, brighter, and more bluish.
f. Pileum darker, and usually more mixed with ochraceous.
Ramphalcyon capensis cyanoptera.
f'. Pileum paler, and usually less mixed with ochraceous.
g. Lower surface darker and more uniform; back and wings somewhat more greenish ..... *Ramphalcyon capensis sodalis.*
g'. Lower surface lighter and less uniform; back and wings rather more bluish ..... *Ramphalcyon capensis mesocca.*
d'. Wing of female usually less than 157 mm.
e. Back dull brownish green.
f. Smaller; pileum more mixed with ochraceous; lower parts much darker ..... *Ramphalcyon capensis simalurensis.*
f'. Larger; pileum less mixed with ochraceous; lower parts much paler ..... *Ramphalcyon capensis isoptera.*
e'. Back bright bluish green.
f. Pileum paler, much varied with ochraceous.
g. Smaller; pileum lighter, and with more ochraceous.
Ramphalcyon capensis capensis.
g'. Larger; pileum more deeply colored, and with less ochraceous.
Ramphalcyon capensis hydrophila.
f'. Pileum darker, varied with but little, if any, ochraceous.
g. Top and sides of head but slightly, if at all, washed with greenish; lower surface darker.
Ramphalcyon capensis malaccensis.
g'. Top and sides of head strongly washed with greenish; lower surface lighter ..... *Ramphalcyon capensis floresiana.*

RAMPHALCYON AMAUROPTERA (Pearson).

Halcyon amauropterus PEARSON, Journ., Asiat. Soc. Bengal, X, 1841, p. 635 (Calcutta, India).

Specific characters.—Upper back, scapulars, wings, and tail seal brown, without any greenish tinge; head, neck, and under parts tawny ochraceous; rump and lower back light turquoise blue; bill red with dusky tip.

Measurements.—Males: Wing, 134–146.5 (average, 141.3); tail, 84–99 (average, 90.2); exposed culmen, 70–82.5 (average, 74.1); tarsus, 17–20.5 (average, 18.1). *Females:* Wing, 142–145 (average, 143.5); tail, 86–87.5 (average, 86.8); exposed culmen, 74; tarsus, 17.5–19 (average, 18.3) mm.

Type-locality.—Calcutta, India.

Geographical distribution.—Eastern Bengal, India, to Arakan, Tenasserim, and Lower Siam.

This very distinct species seems to be subject to little, if any, geographical variation in either size or color, for specimens from Lower Siam and the Mergui Archipelago are just like those from India. There appears to be little distinction of size and none of color between the sexes. Immature birds are distinguishable by dusky tips on the ochraceous feathers of neck and lower parts.

The following specimens of this species have been examined:

Museum and No.	Sex.	Locality.	Date.	Collector.
A. N. S. Phila. 21107	[♂]	India		
U.S.N.M. 173033	♂	Maliwun, Tenasserim	Mar. 18, 1900	Dr. W. L. Abbott.
U.S.N.M. 173034	♂	do	do	Do.
U.S.N.M. 173031	♂	Sullivans Island, Mergui Archipelago.	Feb. 3, 1900	Do.
U.S.N.M. 173032	♂	Pulo Adang, Butang Islands	Dec. 14, 1899	Do.
U.S.N.M. 153781	♂	Trong, Lower Siam	Mar. 17, 1896	Do.
U.S.N.M. 173779	♂	do	Mar. 8, 1896	Do.
U.S.N.M. 153780	♀	do	do	Do.

RAMPHALCYON MELANORHYNCHA MELANORHYNCHA (Temminck).

Alcedo melanorhyncha Temminck, Planch. Col., IV, 1826, pl. cccxci (Celebes).

Specific characters.—Scapulars, middle of back, wings, and tail brown, tinged with greenish or bluish; rest of plumage cream color, becoming buff or ochraceous on the posterior lower surface, and dusky on the sides of head and forehead; bill wholly black.

Measurements.—Wing, 140–154 (average, 148.6); tail, 87–101 (average, 91.2); exposed culmen, 74–84 (average, 79); tarsus, 15–17 (average, 15.6) mm.

Type-locality.—Celebes.

Geographical distribution.—Togian Islands, Celebes, and the adjacent islands of Lembeh, Banka, and Manado tua.

The bill in this form is nearly always entirely black, but sometimes in specimens from middle Celebes there appears a small red spot at its base.

This bird is found probably throughout Celebes, since it has been recorded from the northern, western, middle, and southeastern portions of the island.

Only one specimen has been examined, an adult male (A. N. S. Phila., No. 50028) collected by C. Hose on Mount Masarang, Celebes,

in November, 1895. The measurements above given are taken largely from Meyer and Wiglesworth[a] and from Sharpe.[b]

RAMPHALCYON MELANORHYNCHA EUTREPTORHYNCHA (Hartert).

Pelargopsis melanorhyncha eutreptorhyncha HARTERT, Nov. Zool., V, 1898, p. 128 (Sula Mangoli Island, Sula Islands).

Subspecific characters.—Similar to *Ramphalcyon melanorhyncha dichrorhyncha*, but the red on base of bill much reduced in extent.

Measurements.—Practically identical with those of *Ramphalcyon melanorhyncha dichrorhyncha*.

Type-locality.—Sula Mangoli Island, Sula Islands.

Geographical distribution.—Sula Islands, east of Celebes.

The bill at base has, almost always, at least small spots of red, though these are never so extensive as is usual in *Ramphalcyon melanorhyncha dichrorhyncha*. Curiously enough, *Ramphalcyon m. eutreptorhyncha* is intermediate in characters between *Ramphalcyon melanorhyncha melanorhyncha* and *R. m. dichrorhyncha*, though not so in geographical range.

RAMPHALCYON MELANORHYNCHA DICHRORHYNCHA (Meyer and Wiglesworth).

Pelargopsis dichrorhyncha MEYER and WIGLESWORTH, Abh. k. Zool. und Anthrop. Mus. Dresden, 1896, No. 2, p. 12 (Peling and Banggai islands).

Subspecific characters.—Similar to *Ramphalcyon melanorhyncha melanorhyncha*, but basal half of bill extensively red.

Measurements.—Wing, 151–161; tail, 100; tarsus, 17 mm.

Type-locality.—Peling and Banggai islands, near the eastern coast of Celebes.

Geographical distribution.—Peling Islands and Banggai Island.

The red on the base of the bill varies much individually, being, on the maxilla, sometimes reduced to a spot, sometimes expanded to cover more than half its length; on the mandible extending over usually not less than one-half, in some cases fully three-fourths.

RAMPHALCYON CAPENSIS CAPENSIS (Linnæus).

Alcedo capensis LINNÆUS, Syst. Nat., 12th ed., I, 1766, p. 180 ("Cape of Good Hope;" locality erroneous; should be Java).

Pelargopsis fraseri SHARPE, Proc. Zool. Soc. Lond., 1870, p. 65 (Java).

Subspecific characters.—Crown and occiput light brownish, but much mixed and overlaid with ochraceous; nape and lower surface deep ochraceous, excepting the throat, which is much paler—buff or cream color; mantle bluish green; size small.

[a] Birds Celebes, I, 1898, p. 270.

[b] Cat. Birds Brit. Mus., XVII, 1892, p. 97.

Measurements.—Four males: Wing, 137.5–141 (average, 139); tail, 86.5–92 (average, 88.9); exposed culmen, 70.5–76.5 (average, 73.5); tarsus, 16–17 (average, 16.6). *Three females:* Wing, 147.5–150.5 (average, 148.7); tail, 92–98.5 (average, 94.2); exposed culmen, 70–75.5 (average, 73); tarsus, 17.5–18.5 (average, 17.8) mm.

Type-locality.—Java.

Geographical distribution.—Java, Billiton Island, and southeastern Sumatra to the Indrigiri River.

This race has commonly no distinct cap of brown, but individuals occasionally occur which have a brown pileum, though in such cases the considerable admixture of ochraceous serves, as always, to distinguish this bird from the races to which it is otherwise most closely allied. Various intermediates in this respect occur also. Birds from Billiton Island and southeastern Sumatra are apparently not distinguishable from those taken in Java; at least, with the present limited series, no separation is possible. Northwestward along the eastern side of Sumatra, somewhere about the middle, *Ramphalcyon capensis capensis* passes into *Ramphalcyon capensis cyanopteryx*,[a] a new form from the northwestern end of this island, examples from the Indrigiri River being intermediate.

In *Ramphalcyon capensis capensis*, as in the other forms, there is a noticeable difference between the sexes, so that specimens of the same sex are necessary in making comparisons. This difference consists in the decidedly larger size of the female, as well as her duller, more brownish or greenish mantle.

Concerning the name to be used for the Javan bird, there has been considerable difference of opinion. Linnæus founded his *Alcedo capensis*[b] solely on "Le Martin-pescheur du Cap de Bonne Espérance" (*Ispida capitis bona spei*) of Brisson,[c] and it therefore stands or falls by the identification of the latter, without regard to the determination of the "Martin Pêcheur du Cap de Bonne Espérance" of Daubenton,[d] which later formed the primary basis of Boddaert's *Alcedo capensis*.[e] There can be no doubt, after a careful examination of Brisson's detailed description,[f] that the *Alcedo capensis* of Linnæus refers to one of the blue-backed forms of *Ramphalcyon*, and, such being the case, the name must stand for some one of them.

Brisson's plate is absolutely unidentifiable subspecifically, but his description[f] is a good one, and much better fits the bird from Java than any of the other forms. This was also the opinion of Dr. R. B.

[a] See page 676.

[b] Syst. Nat., 12th ed., I, 1766, p. 180.

[c] Orn., IV, 1760, p. 488, pl. xxxvi, fig. 3.

[d] Tabl. Planch. Enl., 1783, p. 36.

[e] Planch. Enl., pl. 590.

[f] Orn., IV, 1760, pp. 488–489.

Sharpe, when, in 1870, he revised the species of the genus,[a] and his reasons for rejecting the name are merely trivial. He says:[a]

> After carefully comparing a skin of the adult Javan bird with Brisson's elaborate description, I believe that his "*Ispida capitis bonæ spei*" was really taken from a Javan specimen. Consequently the species stands primarily as *Alcedo capensis*, Linn. But in the face of the manifest incongruity of such an appellation, I believe myself justified in proposing a new name for the bird, and I therefore take the opportunity of connecting with it the name of my friend Mr. W. T. Fraser, * * *.

The next year, in another place,[b] he makes the following remarks on the same subject:

> * * * I proposed the name of Mr. W. T. Fraser for the present species instead of retaining the one which seems by right to belong to the bird, viz., *Alcedo capensis* of Linnæus, inasmuch as this name is founded on the "*Ispida capitis bonæ spei*" of Brisson, and if perpetuated could only lend additional confusion as to the correct locality of the species.

What Doctor Sharpe subsequently says[c] about the difficulty of identifying Daubenton's plate has no bearing on the question, for this plate does not enter into the equation at all, since Linnæus did not mention it, although Doctor Sharpe, and some other writers as well, seem to be under the impression that he did. It appears, therefore, that *Alcedo capensis* Linnæus has fully as clear a title as many of the names now in common use, and should stand for the Javan *Ramphalcyon*, since erroneous locality by no means debars a name. The Javan bird should consequently be called *Ramphalcyon capensis capensis* (Linnæus).

The measurements above given were taken from the following specimens:

Museum and No.	Sex.	Locality.	Date.	Collector.
U.S.N.M. 178095	♂	Indrigiri River, Sumatra	Sept. 19, 1901	Dr. W. L. Abbott.
U.S.N.M. 178094	♂	do	Sept. 23, 1901	Do.
A. N. S. Phila. 39093	[♂]	Goenoeng Soegi, Lampong, Sumatra.	Oct.–Nov., 1901	Harrison and Hiller.
A. N. S. Phila. 39096	[♂]	do	do	Do.
A. N. S. Phila. 39094	♀	do	do	Do.
A. N. S. Phila. 39095	♀	do	do	Do.
U.S.N.M. 180516	♀	Tanjong Poetak, Billiton Island.	Aug. 13, 1904	Dr. W. L. Abbott.

RAMPHALCYON CAPENSIS JAVANA (Boddaert).

Alcedo javana Boddaert, Tabl. Planch. Enl., 1783, p. 47 ("Java;" locality wrong; Borneo is doubtless its country of origin).

Alcedo leucocephala Gmelin, Syst. Nat., I. i, 1788, p. 456 ("Java").

Alcedo javanica Shaw, Gen. Zool., VIII, 1812, p. 67 ("Java").

Subspecific characters.—Similar to *Ramphalcyon capensis capensis*, but pileum clear ochraceous without admixture of brown; mantle less greenish blue.

[a] Proc. Zool. Soc. Lond., 1870, p. 66.

[b] Mon. Alcedinidæ, 1871, pp. 103–104.

[c] Cat. Birds Brit. Mus., XVII, 1892, p. 106.

Measurements.—One male: Wing, 141; tail, 92; exposed culmen, 77; tarsus, 16.5. *Two females:* Wing, 150–152.5 (average, 151.3); tail, 93–98 (average, 95.5); exposed culmen, 73.5–75 (average, 74.3); tarsus, 17.5–18 (average, 17.8) mm.

Type-locality.—Borneo.

Geographical distribution.—Borneo.

There seems to be no doubt, as Doctor Hartert has already pointed out,[a] that the earliest name for this form is *Alcedo javana* Boddaert,[b] notwithstanding the supposition of Javan origin. Indeed, Doctor Sharpe himself is of the same opinion,[c] and rejects the name only on account of its erroneous implication. As there is, however, apparently no other reason for its rejection, it ought henceforth to be employed.

The measurements above summarized were taken from the subjoined specimens:

U.S.N.M. No.	Sex.	Locality.	Date.	Collector.
181377	♂	Mouth of Sempang River, West Borneo.	June 9,1907	Dr. W. L. Abbott.
181376	♀	.....do.....	.....do.....	Do.
181375	♀	Sukadana, West Borneo.....	June 6,1907	Do.

RAMPHALCYON CAPENSIS INTERMEDIA (Hume).

Pelargopsis intermedia Hume, Stray Feath., II, 1874, p. 166 (southern Nicobar Islands; Galatea Bay, Great Nicobar Island, may be considered the type-locality, as it is the first mentioned).

Subspecific characters.—Similar to *Ramphalcyon capensis gouldi*, but averaging larger: pileum and cervix lighter ochraceous; blue of back, rump, wings, and tail much less greenish.

Measurements.—Five females: Wing, 151–159 (average, 154.6); tail, 94–105 (average, 96.7); exposed culmen, 73–84 (average, 78.4); tarsus, 18–19 (average, 18.4) mm.

Type-locality.—Galatea Bay, Nicobar Island, Nicobar Islands.

Geographical distribution.—Nicobar Islands.

This race is very well differentiated from *Ramphalcyon c. gouldi*, but is very closely allied to *Ramphalcyon c. javana*, from which, however, it may be distinguished by its slightly larger size and darker, more uniform lower surface, the chin not decidedly paler than the posterior portion.

From *Ramphalcyon capensis gigantea* it differs so greatly by reason of its deeply colored lower surface, pileum, and cervix, and the much more bluish shade of back, wings, and tail, that no comparison is really necessary. Its larger size, less brownish pileum, less green-

[a] Nov. Zool., IX, 1902, pp. 202–203.

[b] Tabl. Planch. Enl., 1783, p. 47.

[c] Cat. Birds Brit. Mus., XVII, 1892, p. 98.

ish mantle, and less whitish chin and throat separate it readily from *Ramphalcyon c. capensis.*

As in *Ramphalcyon capensis gigantea*, *R. c. gouldi*, and *R. c. javana*, the pileum of *R. c. intermedia* reveals little or no brown when the plumage is unworn, for the broad ochraceous tips of the feathers obscure the brown bases; but when the plumage becomes abraded these brown bases are more or less visible on the forehead and crown, though they never produce the solidly brown effect seen in most of the other forms. Specimens of *Ramphalcyon c. intermedia* from Little Nicobar Island are apparently identical with those from Great Nicobar Island.

The following specimens furnished the above-given measurements:

U.S.N.M. No.	Sex.	Locality.	Date.	Collector.
178530	♀	Little Nicobar Island, Nicobar Islands.	Feb. 27, 1901	Dr. W. L. Abbott.
178529	♀	do	Mar. 3, 1901	Do.
178526	♀	Great Nicobar Island, Nicobar Islands.	Mar. 10, 1901	Do.
178527	♀	do	Mar. 11, 1901	Do.
178528	♀	do	Mar. 12, 1901	Do.

RAMPHALCYON CAPENSIS GOULDI (Sharpe).

Pelargopsis gouldi SHARPE, Ibis, 1870, p. 63 (Manila, Luzon, Philippine Islands).

Subspecific characters.—Similar to *Ramphalcyon capensis capensis*, but lower surface more uniform, the throat not much paler than the rest; pileum and cervix more deeply ochraceous, the former without so much mixture of brown; remainder of upper parts lighter and more greenish.

Measurements.—Two males: Wing, 139.5–141.5 (average, 140.5); tail, 82–84 (average, 83); exposed culmen, 80–82 (average, 81); tarsus, 17–18 (average, 17.5). *Two females:* Wing, 147.5–153 (average, 150.3); tail, 90.5–96.5 (average, 93.5); exposed culmen, 76–80.5 (average, 78.3); tarsus, 17–17.5 (average, 17.3) mm.

Type locality.—Manila, Luzon Island, Philippine Islands.

Geographical distribution.—Southwestern Philippines, on the islands of Luzon (Manila), Mindoro, Calamianes, Lubang, Palawan, and Balabac.

This form is in some respects nearer *Ramphalcyon capensis javana* than to *Ramphalcyon c. capensis*, but differs from the former in its more uniform lower surface and in the paler, much more greenish hue of back, wings, and tail. From *Ramphalcyon capensis gigantea* it is easily distinguished by its much more deeply colored lower parts, pileum, and cervix, by smaller size, and somewhat paler mantle. Both of these forms occur on Luzon, *Ramphalcyon c. gouldi* reaching the central part of this island by way of Palawan and Mindoro and

Ramphalcyon c. gigantea the southeastern portion through the Sulu Islands, Mindanao, and Leyte. That the two meet on Luzon is probable, and that they intergrade is indicated by the aberrant specimen of *R. c. gigantea* from Sorsogon mentioned under that form.

The above measurements came from the specimens listed below:

Museum and No.	Sex.	Locality.	Date.	Collector
U.S.N.M. 161211	♂	Mindoro Island, Philippine Islands.	June 2,1888	Dr. F. S. Bourns.
A.N.S. Phila. 49602	♂	Pola, Mindoro, Philippine Islands.	Nov. 20,1903	Dr. E. H. Porter.
U.S.N.M. 161210	♀	Mindoro Island, Philippine Islands.	June 13,1888	Dr. F. S. Bourns.
A.N.S. Phila. 49601	♀	Pola, Mindoro, Philippine Islands.	Oct. 21,1903	Dr. E. H. Porter

RAMPHALCYON CAPENSIS GIGANTEA (Walden).

Pelargopsis gigantea WALDEN, Ann. and Mag. Nat. Hist., 4th ser., XIII, 1874, p. 123 (Salok Solo, Sulu Islands, Philippine Archipelago).

Subspecific characters.—Similar to *Ramphalcyon capensis javana*, but pileum, cervix, and entire lower surface very much paler, varying from deep buff to almost white, and the mantle much more greenish blue.

Measurements.—Five males: Wing, 148.5–152.5 (average, 150.8); tail, 89–94.5 (average, 91.3); exposed culmen, 74.5–78.5 (average, 76.7); tarsus, 16–17.5 (average, 16.8). *Two females:* Wing, 147–155 (average, 151); tail, 84–89.5 (average, 86.8); exposed culmen, 78–82.5 (average, 80.3); tarsus, 17.5–18.5 (average, 18) mm.

Type-locality.—Salok Solo, Sulu Islands, Philippine Islands.

Geographical distribution.—Southern and central parts of the Philippine Archipelago, on the islands of Sulu, Lapac, Tawi Tawi, Bongao, and Sibutu, in the Sulu group; Mindanao, Malanipa, Basilan, Leyte, Dinagat, Masbate, Negros, Panay, Guimaras, Samar, Cebu, Tablas, Sibuyan, Ticao, and the far southeastern end of Luzon.

In its extreme manifestation this race is a very different bird from either *Ramphalcyon capensis capensis* or *Ramphalcyon capensis javana*, for its very pale head and under parts distinguish it at sight. It differs from the former in the same way as from the latter, and additionally in its decidedly larger size. Although *R. c. gigantea* thus appears to very distinct, the extreme individual variations of all these three birds approximate very closely the characters of each. The present race has previously never been recorded from Luzon, but its occurrence on this island, at least near the southeastern end, is attested by a specimen in the collection of the Philadelphia Academy of Sciences, obtained by Dr. E. H. Porter at Sorsogon. This example, while clearly referable to *Ramphalcyon c. gigantea*, shows a decided approach to *Ramphalcyon c. gouldi*, in the more deeply

ochraceous tint of the under surface and of the sides of head and neck. An immature bird from Mindanao is about as deeply colored below. Sexual differences are not so conspicuous in this race as in many of the others.

Measurements above recorded were furnished by the specimens below:

Museum and No.	Sex.	Locality.	Date.	Collector.
U.S.N.M. 192098	♂	Tubay River, Mindanao, Philippine Islands.	Apr. 24, 1904	Dr. E. A. Mearns.
U.S.N.M. 190001	♂	Makar, Mindanao, Philippine Islands.	Oct. 26, 1903	Do.
U.S.N.M. 191981	♂	Mucas, Mindanao, Philippine Islands.	Feb. 15, 1904	Do.
U.S.N.M. 191455	♂	Pasonanca, Mindanao, Philippine Islands.	Dec. 21, 1902	M. L. Robb.
A.N.S. Phila. 49003	♂	Sorsogon, Luzon, Philippine Islands.	Mar. 16, 1903	Dr. E. H. Porter.
U.S.N.M. 190000	♀	Manay, Mindanao, Philippine Islands.	Oct. 23, 1903	Dr. E. A. Mearns.
U.S.N.M. 191980	♀	Mucas, Mindanao, Philippine Islands.	Feb. 15, 1904	Do.

RAMPHALCYON CAPENSIS GURIAL (Pearson).

Alcedo gurial PEARSON, Journ. Asiat. Soc. Bengal, X, 1841, p. 653 (Midnapore, Bengal, India).

Alcyon capensis vel *princeps* HODGSON, in Gray's Zool. Misc., 1844, p. 82 (Nepal).

Halcyon brunniceps JERDON, Madras Journ., XIII, 1844 (1845), p. 143 (Goomsoor, Malabar, and Travancore, India).

Subspecific characters.—Like *Ramphalcyon capensis burmanica*, but pileum darker; lower parts paler, the chin and throat more whitish and more contrasted with breast and abdomen.

Measurements.—Three males: Wing, 153–156 (average, 154.2); tail, 102; exposed culmen, 75.5–82.5 (average, 78.7); tarsus, 17–18.5 (average, 17.7). *One female:* Wing, 159; tail, 102.5; exposed culmen, 80; tarsus, 18.5 mm.

Type locality.—Midnapore, Bengal, India.

Geographical distribution.—Peninsula of India, excepting the northwestern part, south to Ceylon, north to Sikkim, and east to Assam and Manipur.

This race is most closely allied to *Ramphalcyon c. burmanica*, and like it is distinguished from the other above-described forms by its brown pileated head. From both *Ramphalcyon c. gouldi* and *Ramphalcyon c. intermedia* it differs in its paler chin and throat, more contrasted with the remaining lower parts, and in other characters as does *Ramphalcyon c. burmanica*. Examples from Assam and Manipur are said by Doctor Sharpe[a] to be intermediate between the present race and *Ramphalcyon capensis burmanica*. It is possible

[a] Cat. Birds Brit. Mus., XVII, 1892, p. 102.

that the birds from the southern part of the Indian peninsula will ultimately prove different from those of the north, in which case the *Halcyon bruniceps* of Jerdon[a] should be their name.

The measurements above given are from the following specimens:

Museum and No.	Sex.	Locality.	Date.	Collector.
U.S.N.M. 102004	[♂]	Sikkim, India		T. O. Russell.
A.N.S.Phila. 21114	♂	India		
A.N.S.Phila. 21113	[♂]	do		Doctor Huffnagle.
A.N.S.Phila. 50029	[♀]	do		

RAMPHALCYON CAPENSIS BURMANICA (Sharpe).

Pelargopsis burmanica SHARPE, Proc. Zool. Soc. Lond., 1870, p. 67 (Tonghoo, Burma).

Subspecific characters.—Resembling *Ramphalcyon capensis capensis*, but much larger: pileum conspicuously capped with dull brown, without admixture of ochraceous; back, wings, and tail lighter and decidedly more greenish.

Measurements.—Three males: Wing, 143–154.5 (average, 149.7); tail, 92.5–98 (average, 94.7); exposed culmen, 71–79.5 (average, 76.5); tarsus, 17–18 (average, 17.7). *One male:* Wing, 162; tail, —; exposed culmen, 77.5; tarsus, 19 mm.

Type-locality.—Tonghoo, Burma.

Geographical distribution.—Andaman Islands, Burma, and Tenasserim, east to Siam, Cambodia, and Cochin China.

The present race may be distinguished at a glance from *Ramphalcyon c. javana*, *R. c. gigantea*, *R. c. gouldi*, and *R. c. intermedia* by its very conspicuous brown cap, and from each of these by other characters as well. It has the pale and very greenish back, wings, and tail of *Ramphalcyon c. gouldi*, but even more strongly developed. There is considerable individual variation in *Ramphalcyon c. burmanica*, particularly in the color of the pileum. Young or immature birds, as in some of the other races, appear to be somewhat darker than adults. Specimens from Siam seem to be rather larger than those from Burma. Birds from the Andaman Islands are said to be still paler than those from the mainland, and may ultimately be found to represent an unnamed race.

The specimens supplying the above measurements are as follows:

Museum and No.	Sex.	Locality.	Date.	Collector.
U.S.N.M. 102003	[♂]	Siam		R. Schomburghk.
A.N.S.Phila. 21117	[♂]	do		Prince Monifanoi.
A.N.S.Phila. 50031	♂	Thoungyui, Burma	Feb. —, 1893	T. A. Hauxwell.
A.N.S.Phila. 50032	[♀]	Burma		E. W. Oates.

[a] Madras Journ., XIII, 1844 (1845), p. 143.

RAMPHALCYON CAPENSIS SIMALURENSIS (Richmond).

Pelargopsis simalurensis Richmond, Proc. U. S. Nat. Mus., XXVI, 1903, p. 498 (Simalur Island, western coast of Sumatra).

Subspecific characters.—Similar to *Ramphalcyon capensis burmanica*, but smaller; back, wings, and tail darker, somewhat more bluish; pileum with more of an ochraceous tinge, and lower surface rather more deeply colored.

Measurements.—*Three males:* Wing, 139–141 (average, 140); tail, 89.5–93 (average, 91.5); exposed culmen, 78.5–79 (average, 78.7); tarsus, 16.5–17 (average, 16.8). *Three females:* Wing, 145–151 (average, 147.8); tail, 94–100 (average, 96.8); exposed culmen, 72–82.5 (average, 77.8); tarsus, 17.5–18.5 (average, 18) mm.

Type locality.—Simalur Island, western coast of Sumatra.

Geographical distribution.—Simalur Island, western coast of Sumatra.

This excellent form differs from *Ramphalcyon c. gurial* about as from *R. c. burmanica*, and additionally in lacking the whitish chin and throat, these parts being ochraceous buff, and not so much paler than the remaining lower surface. It is of the same size as *Ramphalcyon capensis capensis*, but is readily separable by its distinctly brown-capped pileum, with but very little ochraceous tinge, duller, much more greenish back, wings, and tail, and more deeply colored, more uniform lower surface. So far as known, *Ramphalcyon capensis simalurensis* is confined to the island of Simalur, for the neighboring islands and the mainland of Sumatra are inhabited by different forms, as hereinafter described. It seems to be, however, certainly only a subspecies, connected by individual variations with the mainland race through the birds from Nias and the Batu Islands. The females of *Ramphalcyon capensis simalurensis* differ considerably from the males in larger size, duller wings and tail, and decidedly duller, more brownish back.

The following specimens have been examined:

U.S.N.M. No.	Sex.	Locality.	Date.	Collector.
179205	♂	Simalur Island[a]	Nov. 29, 1901	Dr. W. L. Abbott.
179206	♂	....do....	Nov. 27, 1901	Do.
179743	♂	Sibobo Bay, Simalur Island	Oct. 23, 1902	Do.
179202	♀	Simalur Island	Nov. 29, 1901	Do.
179203	♀	....do....	Nov. 30, 1901	Do.
179204	♀	....do....	Nov. 27, 1901	Do.

[a] Type.

RAMPHALCYON CAPENSIS ISOPTERA, new subspecies.

Subspecific characters.—Similar to *Ramphalcyon capensis simalurensis*, but larger, the crown with less ochraceous, the lower back and rump more greenish, and the under surface decidedly paler.

Description.—Type, adult male, No. 179750, U.S.N.M.; Sikakap Strait, Pagi Islands, December 30, 1902; Dr. W. L. Abbott. Pileum and sides of head hair brown; upper back, superior tail-coverts and wing-coverts terre verte green; wing-quills and rectrices fuscous, their exposed surfaces when closed mostly bluish myrtle green; lower back and rump nile blue; chin cream buff; throat, jugulum, and a cervical collar deep buff, shading into ochraceous on breast, abdomen, and lower tail-coverts; lining of wing ochraceous.

Measurements of the type series are as follows:

U.S.N.M. No.	Sex.	Locality.	Date.	Total length.[a]	Wing.	Tail.	Exposed culmen.	Tarsus.
179750	♂	Sikakap Strait, Pagi Islands[b]	Dec. 30, 1902	378	152.5	95	81.5	17.5
179753	♂	Sikakap Strait, North Pagi Island	Nov. 11, 1902	370	145	94	82	17
179752	♂	North Pagi Island, Pagi Islands	Jan. 1, 1903	375	149	97.5	77	16
179747	♂	South Pagi Island, Pagi Islands	Dec. 3, 1902	370	150	94	73.5	17.5
179748	♂	.....do	Dec. 5, 1902	371	147	93	80	16.5
179749	♂	.....do	Dec. 10, 1902	355	149	90	78	16.5
		Average of six males		369.8	148.8	93.9	78.7	16.8
179746	♀	South Pagi Island, Pagi Islands	Nov. 19, 1902	392	154	96	85	18
179751	♀	North Pagi Island, Pagi Islands	Nov. 20, 1902	380	148	92	79	18
		Average of two females		386	151	94	82	18

[a] Measured in the flesh by the collector, Dr. W. L. Abbott.
[b] Type.

Geographical distribution.—North and South Pagi islands, western coast of Sumatra.

This new form differs noticeably from *Ramphalcyon capensis sodalis* in its smaller size and paler, less uniform lower surface. From *Ramphalcyon c. gurial* it may readily be distinguished by its smaller size, darker back and wings, paler pileum, and less whitish throat; from *R. c. burmanica* by smaller size, much paler, less uniform lower surface, darker back and wings; and from *Ramphalcyon capensis capensis* still more easily by reason of its larger size, much duller and greenish instead of bluish upper back, wings, and tail, lighter, more greenish lower back and rump, brown-capped pileum with little or no wash of ochraceous, and paler lower parts.

In geographical position this is the most southeastern of the races that have their home on the islands off the western coast of Sumatra, and it exhibits an interesting combination of characters. In size it is nearest *Ramphalcyon capensis cyanopteryx*, the mainland form from northwestern Sumatra above described; in the color of the lower surface it is almost exactly a counterpart of the bird from Nias, while in the shade of upper back, wings, and tail it is almost indistinguish-

able from *Ramphalcyon capensis simalurensis*. So far as known *Ramphalcyon c. isoptera* is confined to the Pagi Islands, though it may, perhaps, be found on the islands lying just to the northwest. The United States National Museum series of eight specimens is very uniform, showing no differences between birds from North Pagi Island and those from South Pagi Island, nor any very appreciable individual variations, except in some cases a lightening of the pileum or lower surface, due to wear of the plumage.

Except in size, there seems to be less contrast between the sexes than in some of the other subspecies, but the female is usually duller and more brownish on the upper back and wings than the male.

RAMPHALCYON CAPENSIS SODALIS (Richmond).

Pelargopsis sodalis RICHMOND, Proc. U. S. Nat. Mus., XXVI, 1903, p. 499 (Pulo Tuangku, Banjak Islands, western coast of Sumatra).

Subspecific characters.—Similar to *Ramphalcyon capensis simalurensis*, but much larger; female with wings and tail more bluish, the back less brownish, and the pileum somewhat paler.

Measurements.—Two females: Wing, 158.5–161 (average, 159.8); tail, 102–104 (average, 103); exposed culmen, 84.5–85.5 (average, 85); tarsus, 19–21 (average, 20) mm.

Type-locality.—Pulo Tuangku, Banjak Islands, western coast of Sumatra.

Geographical distribution.—Pulo Tuangku and probably the remaining Banjak Islands, off the northwestern coast of Sumatra.

This race is, as would be expected from its geographical position, intermediate between *Ramphalcyon c. simalurensis* and *Ramphalcyon c. nesoeca*, the form found on Nias. The females of *R. c. simalurensis* and *R. c. sodalis* differ as above mentioned, but the female of the latter is, except for its rather lighter pileum, practically identical in color with the *male* of *R. c. simalurensis*. The male of *R. c. sodalis* is unknown. This form is very similar to *Ramphalcyon c. burmanica*, being of the same size and same color below, but it is distinguishable by its paler pileum, darker back, and more bluish wings and tail. It is less like *Ramphalcyon c. gurial*, differing from this as from *R. c. burmanica*, and additionally in its darker, more uniformly ochraceous lower surface. It is much larger than *Ramphalcyon capensis capensis*, with a much less ochraceous pileum, more greenish or brownish back, and less distinctly paler throat. From all the above-described forms without a brown cap it is, of course, readily separated.

A second specimen has the pileum much paler than the type, showing in this respect considerable individual variation, though part of this may be due in this instance to wear.

The two examples from which this race was described are the only ones that have been examined:

U.S.N.M. No.	Sex.	Locality.	Date.	Collector.
179208	♀	Pulo Tuangku, Banjak Islands[a]	Jan. 25, 1902	Dr. W. L. Abbott.
179207	♀	do	Feb. 4, 1902	Do.

[a] Type.

RAMPHALCYON CAPENSIS NESOECA, new subspecies.

Subspecific characters.—Resembling *Ramphalcyon capensis isoptera*, but pileum paler; back, wings, and tail much brighter and more bluish.

Description.—Type, adult male, No. 180865 U.S.N.M.; Mojeia River, Nias Island, northwestern Sumatra, March 15, 1905; Dr. W. L. Abbott. Pileum and sides of head, including auriculars but not malar region, grayish hair brown, the feathers narrowly edged with buffy or cream color; cervix with a conspicuous ochraceous buff collar, continuous with lower parts; upper back, scapulars, superior tail-coverts, and wings myrtle green; the wing-quills and rectrices fuscous, their exposed surfaces when closed mostly bluish green; lower back and rump nile blue; chin and throat buff, shading into ochraceous on the posterior lower surface; lining of wing ochraceous; "bill blood color, blackish at tip; feet coral red."

Measurements of the type-series follow:

U.S.N.M. No.	Sex.	Locality.	Date.	Total length. (a)	Wing.	Tail.	Exposed culmen.	Tarsus.
179757	♂	Nias Island	Mar. 13, 1903	360	144	92	81.5	16
180864	♂	Telok Blukn, Nias Island.	Mar. 2, 1905	375	148	93	83	18
180865	♂	Mojeia River, Nias Island.[b]	Mar. 15, 1905	375	147	91	76.5	17.5
179756	♂	Lafau, Nias Island	Mar. 22, 1903	360	148.5	90.5	78	17
179754	♂	do	do	365	143	92	82	16.5
179744	♂	Pulo Pinie, Batu Islands.	Mar. 6, 1903	377	151	90	80	18.5
Average of six males				368.6	146.9	91.4	80.2	17.3
179755	♀	Lafan, Nias Island	Mar. 23, 1903	385	161.5	102	80.5	17
179745	♀	Pulo Pinie, Batu Islands.	Mar. 6, 1903	395	160.5	95	86.5	18.5
Average of two females				390	161	98.5	83.5	17.8

[a] Measured in the flesh by the collector, Dr. W. L. Abbott.
[b] Type.

Geographical distribution.—Nias Island and the Batu Islands, western Sumatra.

This race differs very much from *Ramphalcyon capensis simalurensis* in its larger size, paler pileum, brighter, more bluish upper back, wings, and tail, and lighter, less uniform lower surface. It seems to be most closely allied to *Ramphalcyon capensis sodalis*, but

as no one has yet obtained males of that form, final comparison is, of course, impossible; but so far as the females indicate, the principal differences lie in the lighter, less uniform lower surface, and rather more bluish back and wings of *Ramphalcyon c. nesoeca*.

The most obvious distinctions between the present bird and *Ramphalcyon capensis capensis* are the former's much larger size, and its paler, brown-capped pileum, with little or no admixture of ochraceous; but, in addition, the chin and upper throat are usually less contrasted with the remainder of the lower surface. The more uniform under parts, the paler pileum, together with the much brighter, deeper, and more bluish back, wings, and tail, easily distinguish *Ramphalcyon c. nesoeca* from *Ramphalcyon c. gurial;* while the darker, brighter, more bluish back, wings, and tail and somewhat paler ventral aspect separate it from *Ramphalcyon c. burmanica*.

Two specimens, male and female, from Pulo Pinie, Batu Islands, appear to belong to this form, although they are both rather less bluish above than Nias examples. This is possibly to be expected, as indicating a tendency toward intergradation with *Ramphalcyon c. isoptera* from the Pagi Islands; and the chain of evidence would probably be complete were specimens at hand from the intervening islands.

As is evident from the measurements above given, there is great difference of size between the sexes in the present race. The contrast in color is quite as marked, the female being very much duller and less bluish on upper back, wings, and tail. The divergence is confined to these parts, however, for, as in all the other forms, the color of the pileum and entire lower surface is apparently identical in male and female. The series examined is very uniform, but in some of the birds abrasion has somewhat lightened the tone of the lower parts, and made considerable similar change on the pileum, while the same influence has made the upper back, wings, and tail rather more bluish.

The four forms of *Ramphalcyon capensis* that inhabit the islands off the northwestern coast of Sumatra fall naturally into two divisions, according to the general tone of the posterior upper surface, but, strange to say, they do not in this respect correspond very well to geographical considerations, for *Ramphalcyon c. simalurensis* and *R. c. isoptera* from the Pagi Islands, which are the two most widely separated, have dull greenish back, wings, and tail; while the two other races, *R. c. nesoeca*, from Nisas Island, and *R. c. sodalis* (judging from its female) have a much brighter, more bluish shade on the same parts. In most other characters the differences, considered geographically, are nearly as peculiar.

RAMPHALCYON CAPENSIS CYANOPTERYX, new subspecies.

Subspecific characters.—Similar to *Ramphalcyon capensis capensis*, from Java, but larger; pileum darker, less ochraceous, and distinctly brown-capped; upper back, wings, and tail more bluish.

Description.—Type, adult male, No. 179210, U.S.N.M.; Tapanuli Bay, northwestern Sumatra, March 22, 1902; Dr. W. L. Abbott. Pileum and sides of head bister brown, much mixed with ochraceous, but forming a distinct cap; upper back, wing-coverts, and upper tail-coverts bluish myrtle green; wing-quills and rectrices sepia brown, their exposed surfaces when closed mostly greenish indigo blue; lower back and rump turquoise blue; chin cream buff; upper throat buff; remainder of lower surface, together with a broad cervical collar, rather light tawny ochraceous; lining of wing ochraceous buff.

Measurements are as follows:

U.S.N.M. No.	Sex.	Locality.	Date.	Total length. (a)	Wing.	Tail.	Exposed culmen.	Tarsus.
179211	♂	Tapanuli Bay, west Sumatra.	Feb. 23, 1902	368	142.5	94.5	72.5	15.5
179210	♂	do. b	Mar. 22, 1902	355	146	93.5	72	16
180968	♂	Tarussan Bay, west Sumatra.	Jan. 15, 1905	362	145.5	85.5	73	16
181093	♂	Besitan River, east Sumatra.	Nov. 17, 1905	380	143.5	91	72.5	17
Average of four males				366.2	144.4	91.1	72.5	16.1
179212	♀	Tapanuli Bay, west Sumatra.	Mar. 26, 1902	381	163	99	75	20

(a) Measured in the flesh by the collector, Dr. W. L. Abbott.
(b) Type.

Geographical distribution.—Northwestern Sumatra, with Pulo Mansalar; northeastern Sumatra south at least to the Besitan River.

That the bird from northwestern Sumatra is so unlike that of the southeastern part of this island is an interesting discovery; and, curiously enough, this new form is more bluish on the back, wings, and tail than any of the races by which it is surrounded. It may be distinguished from *Ramphalcyon capensis malaccensis* by its paler pileum, with usually more admixture of ochraceous, more bluish upper back, wings, and tail, lighter lower parts, the chin and throat less uniform with the rest, and slightly greater average size. It resembles *Ramphalcyon capensis mesocca*, but has the pileum darker and usually with more ochraceous, the back, wings, and tail much more bluish, and the lower parts more deeply colored. It differs greatly, however, from *Ramphalcyon capensis isoptera* in its darker, more ochraceous pileum, much brighter and more bluish back, wings, and tail, and more deeply colored lower parts.

It is smaller than *Ramphalcyon capensis sodalis*, has a darker pileum more mixed with ochraceous, and is more bluish on the back, wings, and tail. From *Ramphalcyon c. simalurensis* it differs still

more in its larger size, very much more bluish posterior upper parts, darker, more ochraceous pileum, and paler, less uniform lower parts. It is smaller than either *Ramphalcyon c. gurial* or *Ramphalcyon c. burmanica*, and, furthermore, departs so greatly from both in its more ochraceous pileum and much darker, brighter, more bluish back, wings, and tail that it is distinguishable at a glance. With the forms that have no brown cap it, of course, needs no special comparison.

The female of this race is very much larger than the male, and usually more greenish on upper back, scapulars, and wing-coverts, but there is not much other difference.

The single adult male from Tarussan Bay, western Sumatra, is like the type, though more worn. A bird from Pulo Mansalar, off the entrance to Tapanuli Bay, apparently belongs to this form: it is, according to the label, a female, and in color practically agrees with a female from Tapanuli Bay; but it is very small, about the size of males from the mainland; so that if it does not prove to belong to another subspecies, it is probably an immature male, notwithstanding its general appearance of maturity. In a few examples of the U. S. National Museum series the pileum has a noticeable wash of greenish, but this is not constant enough to be diagnostic.

RAMPHALCYON CAPENSIS HYDROPHILA, new subspecies.

Subspecific characters.—Similar to *Ramphalcyon capensis capensis*, from Java, but larger; pileum with much less ochraceous, darker, and more distinctly capped with brown; lower surface averaging slightly darker and more uniform.

Description.—Type, adult male, No. 170447, U.S.N.M.; Singapore Island, May 27, 1899; Dr. W. L. Abbott. Pileum and sides of head hair brown, the feathers more or less margined with buff or cream color; upper back and superior tail-coverts bluish French green; wings and tail largely fuscous, but when closed their exposed surfaces bluish myrtle green; lower back and rump nile blue; cervical collar ochraceous buff; chin buff, shading into the ochraceous of the remaining lower surface; lining of wing tawny ochraceous. "Feet red, claws horn brown; eyelids red; iris dark brown; bill red, blackish at tip."

Measurements are as below:

U.S.N.M. No.	Sex.	Locality.	Date.	Total length. (a)	Wing.	Tail.	Exposed culmen.	Tarsus.
170447	♂	Singapore Island[b]	May 27, 1899	349	145.5	93.5	75	17.5
178996	♀	Lingga Island	Aug. 25, 1901	387	154	97	86	18
179484	♀	Pulo Bintang	Aug. 13, 1901	387	152	96.5	79.5	18
Average of two females				387	153	96.8	82.8	18

[a] Measured in the flesh by the collector, Dr. W. L. Abbott.
[b] Type.

Geographical distribution.—Islands of Singapore, Lingga, and Bintang, off the southern end of the Malay Peninsula.

Of the several forms of *Ramphalcyon capensis*, this new one seems to be most closely allied to *Ramphalcyon c. sodalis*, but differs by reason of its inferior size, and darker, more ochraceous pileum. It is larger, with a more ochraceous pileum, and much brighter, more bluish back, wings, and tail than *Ramphalcyon c. simalurensis;* while it differs so greatly from both *Ramphalcyon c. burmanica* and *R. c. gurial* in its smaller size, more ochraceous pileum, and much brighter, darker, more bluish back, wings, and tail, that it is separable at a glance. It is somewhat similar to *Ramphalcyon capensis cyanoptera*, but has the back, wings, and tail much less bluish, and the pileum usually lighter; it differs from *Ramphalcyon capensis nesoeca* in its smaller size, darker, more ochraceous pileum, more deeply and uniformly colored lower surface, and rather less bluish wings; and it is very unlike *Ramphalcyon capensis isoptera*, on account of its much brighter, more bluish back, wings, and tail, more ochraceous pileum, and darker, more uniform under parts.

It may seem unwise to describe another form of *Ramphalcyon capensis* from so near the type-locality of *Ramphalcyon c. malaccensis*, but the birds from Singapore, Lingga, and Bintang islands are clearly not *R. c. malaccensis*, of which the Museum has a good series from the Malay Peninsula, nor are they *R. c. capensis;* and although in fact somewhat intermediate between these two, are yet different enough to be worthy a name. So far as it is possible to tell from the limited series now at hand, the birds from all three of the above-mentioned islands are identical.

RAMPHALCYON CAPENSIS MALACCENSIS (Sharpe).

Pelargopsis malaccensis SHARPE, Proc. Zool. Soc. Lond., 1870, p. 67 (Malacca, Malay Peninsula).

Subspecific characters.—Similar to *Ramphalcyon capensis hydrophila*, but pileum much darker and much less mixed with ochraceous.

Measurements.—Six males: Wing, 137.5–146 (average, 141.5); tail, 86–94 (average, 89.9); exposed culmen, 68.5–75 (average, 71.2); tarsus, 16–18 (average, 16.8). *Three females:* Wing, 147–156 (average, 152.8); tail, 98–100 (average, 99.3); exposed culmen, 73–78.5 (average, 76.3); tarsus, 18.5–19 (average, 18.8) mm.

Type-locality.—Malacca, Malay Peninsula.

Geographical distribution.—Malay Peninsula south of Tenasserim.

This well-marked race may easily be distinguished from *Ramphalcyon capensis capensis* by its much darker, less ochraceous pileum, and more deeply colored, more uniform lower surface; from *Ram-*

phaleyon c. burmanica by smaller size, deeper brown pileum, and darker, brighter, more bluish back, wings, and tail; and still more readily from *R. c. gurial* by far more deeply, more uniformly colored under parts, in addition to the same characters by which it is separated from *R. c. burmanica*. It differs much from both *Ramphaleyon c. simalurensis* and *Ramphaleyon c. isoptera* in its darker pileum, decidedly brighter, more bluish back and wings, and additionally from the latter in its darker, more uniform lower surface. It is more nearly like *Ramphaleyon c. sodalis* and *R. c. nesoeca*, but is smaller, has a much more deeply colored pileum and usually darker ventral surface. With the several forms that have a plain ochraceous or buffy pileum no special comparison of *R. c. malaccensis* is needed, while the differences that separate it from *Ramphaleyon c. cyanopteryx* have already been fully discussed.[a]

There is rather more than usual purely individual variation in this race, affecting the depth of color on the pileum as well as the lower parts, but not so much the posterior upper surface. There is sometimes a slight gloss of greenish on the pileum. These variations may account for the supposed occurrence of *Ramphaleyon capensis capensis* (olim *fraseri*) within the territory of *R. c. malaccensis;* for since these two forms intergrade, and as they do not migrate, they, of course, nowhere live in the same locality. Sexual distinctions—the larger size, and duller, less bluish posterior upper parts of the female—are about as usual, but are rather less pronounced than in the forms from some of the islands off the western coast of Sumatra.

Measurements given above are from the subjoined specimens:

U.S.N.M. No.	Sex.	Locality.	Date.	Collector.
153787	♂	Trong, Lower Siam	July 6, 1896	Dr. W. L. Abbott.
153782	♂	do	May 10, 1896	Do.
153784	♂	do	June 27, 1896	Do.
175055	♂	Packa, Tringanu, Malay Peninsula	Sept. 26, 1900	Do.
178951	♂	Jambu Luang, Johore, Malay Peninsula.	Aug. 2, 1901	Do.
100235	[♂]	[Malacca?]		
153786	♀	Trong, Lower Siam	July 4, 1896	Dr. W. L. Abbott.
153783	♀	do	May 22, 1896	Do.
153785	♀	do	June 27, 1896	Do.

RAMPHALCYON CAPENSIS FLORESIANA (Sharpe).

Pelargopsis floriana SHARPE, Proc. Zool. Soc. Lond., 1870, p. 68 (Flores).
Pelargopsis sasak VORDERMAN, Nat. Tijdschr. Ned. Ind., LIV, 1895, p. 334 (Laboean hadji, Lombok Island).

Subspecific characters.—Similar to *Ramphaleyon capensis malaccensis*, but top and sides of head strongly washed with green: lower parts paler ochraceous.

[a] See page 676.

Measurements.—Wing, 145; tail, 91; culmen, 81; tarsus, 11.5 mm.

Type-locality.—Island of Flores.

Geographical distribution.—The islands of Flores and Lombok.

No specimens have been examined, and this race is here recognized on the strength of Doctor Sharpe's descriptions,[a] by which its validity is indicated. The Lombok bird, too, described as *Pelargopsis sasak* by Vorderman,[b] is above synonymized on the authority of Doctor Sharpe.[c]

[a] Proc. Zool. Soc. Lond., 1870, p. 68; Cat. Birds Brit. Mus., XVII, 1892, p. 103.

[b] Nat. Tijdschr. Ned. Ind., LIV, 1895, p. 334.

[c] Hand-List Gen. and Spec. Birds, II, 1900, p. 49.